Bellwork: 4/12/13

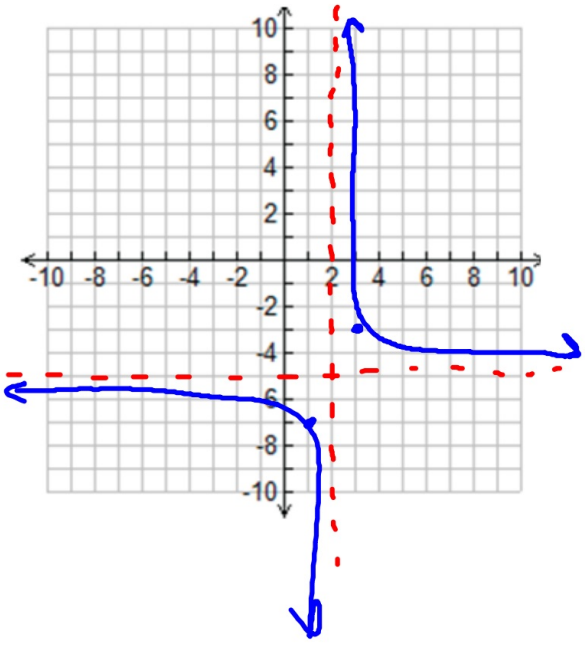
Graph the following function:

$$y = \frac{2}{x-3} - 5$$

$a = 2$

(h, k)

$(3, -5)$



Section 8.3 - Finding Vertical and Horizontal Asymptotes

restrictions

To find a vertical asymptote, set the denominator equal to 0 and solve for x. The answer(s) are the values that x CANNOT be. Vertical asymptotes are x=#.

examples:

1) $\frac{2x-5}{x+7}$

$x+7=0$

VA: $x=-7$

2) $\frac{3x+19}{(x-2)(x+4)}$

$x-2=0 \quad x+4=0$

VA: $x=2, -4$

3) $\frac{x^2+5x-9}{x^2-7x+12}$

$(x-4)(x-3)$

$x-4=0 \quad x-3=0$

VA: $x=4, 3$

highest exp.

Finding horizontal asymptotes is all based on the degrees of the numerator and denominator...horizontal asymptotes are y=

If the degree is bigger on the top there are NO horiztonal asymptotes. example: $\frac{x^2}{x}$ none

If the degree is bigger on the bottom, the horizontal asymptote is y = 0. example: $\frac{x}{x^2}$ $y=0$

If the degrees are the same, the horizontal asymptote is the leading coefficients of each highest exponent. example: $\frac{2x}{3x}$

$y=\frac{2}{3}$

examples:

4) $\frac{3x-8}{x^2-5x+6}$ bottom $y=0$

5) $\frac{3x^3-4x^2+7}{1x^3-6}$ same $y=3$

6) $\frac{x^2+8x-1}{9x-4}$ top none

Putting it all together:

Find the Vertical and Horizontal Asymptotes for each function:

7) $\frac{x+1}{(x-2)(x-3)}$ bottom

x^2

$x-2=0 \quad x-3=0$

den=0 $x=2,3$

VA: $x=2,3$

HA: $y=0$

rules

8) $\frac{2x}{x-6}$ same

$x-6=0$

den=0 $x=6$

VA: $x=6$

HA: $y=2$

rules

9) $\frac{x^2-9}{3x-12}$ top

$3(x-4) \quad 3x-12=0$

$3x=12$

$x=4$

den=0 $x=4$

VA: $x=4$

HA: none

rules

10) $\frac{-2x+6}{1x-5}$ same

$x-5=0$

VA: $x=5$

HA: $y=-2$

11) $\frac{x-1}{x^2-4x+4}$ bottom

$(x-2)(x-2)$

$x-2=0$

VA: $x=2$

HA: $y=0$

12) $\frac{x^3-4x+7}{2x^2-7x+6}$ top 12

$(2x^2-4x)(-3x+6)$

$2x(x-2)-3(x-2)$

$(2x-3)(x-2)$

VA: $x=\frac{3}{2}, 2$

HA: none

Homework: Worksheet 8.3